

Remarks

Claims 1-9, 12-21 and 24 are currently pending in this application. By this amendment, applicant requests that claims 1-13, 15, 19 and 22-24 be canceled and new claims 25 and 26 be added. Therefore claims 14, 16-18, 20-21 and 25-26 are presented to the Examiner for consideration.

The method of the subject invention allows continuous and accurate chemical information to be obtained from optical chemical sensors in industrial, medical and environmental monitoring applications. Accurate and continuous readings can be achieved with little sensor maintenance and no operator. The subject method provides a means to take calibration-free measurements that are identical between sensors and allow a sensor to be easily checked to determine instrument condition. The calibration-free method of the subject invention uses sensors that measure the optical absorbance of an indicator. The sensors have been modified to allow renewal of the indicator. This indicator must have two different optical spectra, one when reacted with the analyte and another when unreacted. The indicator is allowed to equilibrate with the analyte. An intensity reading of the equilibrated indicator and analyte is taken at a first wavelength where the indicator is in an unreacted form and a second wavelength where the indicator is in a reacted form with the analyte. The system is flushed and a readings at the first and second wavelengths are taken for a spectrophotometric blank. Wavelength and photometric accuracy must be verified. Sensor response is then calculated using a ratio of the absorbance of the equilibrated indicator/analyte relative to the absorbance of the blank solution.

Claims 1-5, 7 and 13-17 have been rejected under 35 U.S.C. §102(b) over Burgess, Jr. Burgess, Jr. describes a flow optrode having separate reaction and detection chambers capable of continuously measuring the presence and concentration of an analyte. Burgess, Jr. does not describe the calibration-free method of the subject invention. Burgess, Jr. does describe a sensor with a renewable indicator. He does not however describe using this sensor as a calibration-free sensor. The sensor and method of Burgess, Jr. do not require verification of the wavelength and photometric accuracy nor do they require use of a ratio to calculate sensor response. Readings of Burgess, Jr. are taken relative to a chemical blank not a spectrophotometric blank (solution with no indicator) as the

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readings in the method of the subject invention. Burgess, Jr. has no valve to allow the system to be flushed to provide a spectrophotometric blank. The cited reference does not describe the calibration-free method of the subject invention. Reconsideration and withdrawal of the rejection based on this reference is therefore respectfully requested.

Claims 1, 2, 4-9, 12-14, 16-21 and 24 have been rejected under 35 U.S.C. § 102(b) over DeGrandpre *et al.* DeGrandpre *et al.* disclose the SAMI-CO₂ sensor used in the exemplified embodiment. Further, DeGrandpre *et al.* disclose use of a ratio in making certain absorbance measurements. The cited reference does not however describe the claimed method of taking calibration-free measurements. To achieve calibration-free measurement, it is important that reagent preparation be accurate and reproducible, that wavelengths be calibrated and that stray light be omitted as described in the subject application. Sensor readings taken outside the specified range of the parameters do not allow for calibration-free measurement. New claim 25 clearly recites the steps required to achieve calibration-free operation of absorbance-based chemical sensors. The cited reference does not describe the calibration-free methodology of the subject invention. Applicant therefore respectfully requests reconsideration and withdrawal of the rejection.

In view of the foregoing remarks and the amendments to the claims, applicant believes that the claims are now in condition for allowance and such action is respectfully requested.

Applicant invites the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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